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MATE AUTOMATION

Graphite Die Molding Machine

MGM-28

Operation Manual

SUZHOU INDUSTRIAL PARK MATE AUTOMATION

TECHNOLOGY CO., LTD

www.suzhoumate.com

Thanks for using our products. Before use, please read this menu carefully and keep it for future reference. Thanks for your understanding if there's any discrepancies between the manual and practical operation process due to technical update ceaselessly.

SUZHOU INDUSTRIAL PARK MATE AUTOMATION TECHNOLOGY CO.,LTD
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Company brief

Suzhou Industrial Park Mate Automation Technology Co., Ltd. is a metallic gasket and equipment manufacturing and selling company. We are located in Suzhou - a city well known for its Chinese classic garden, south of Jiangsu Province, China. With our technology, we offer our customers very wide variety of metallic gasket equipments, such as

Spiral wound gasket winding machine;

Kammprofile machine;

Guide ring grooving machine;

Double jacket gasket machine

Graphite die moulding machine

Inner ring beveling machine;

Bend & weld machine;

Laser marking machine;

as well as computer controlled gasket performance test machine.

Our concept is to provide our customers with one-stop service for all metallic gasket related products, parts, and equipment. We have successfully sold our products and equipment to customers in the Asia USA Europe Middle east and South America.

We welcome all customers from abroad and home.

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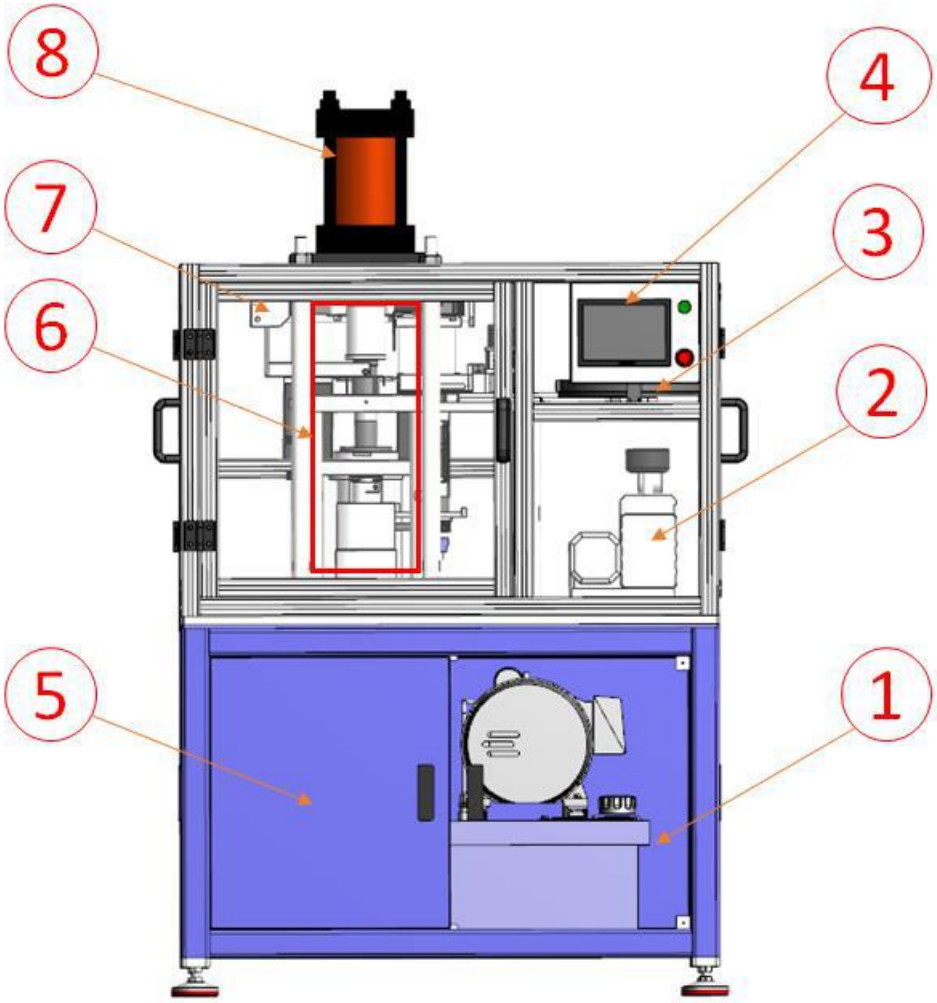
MGM-28 Machine Overview



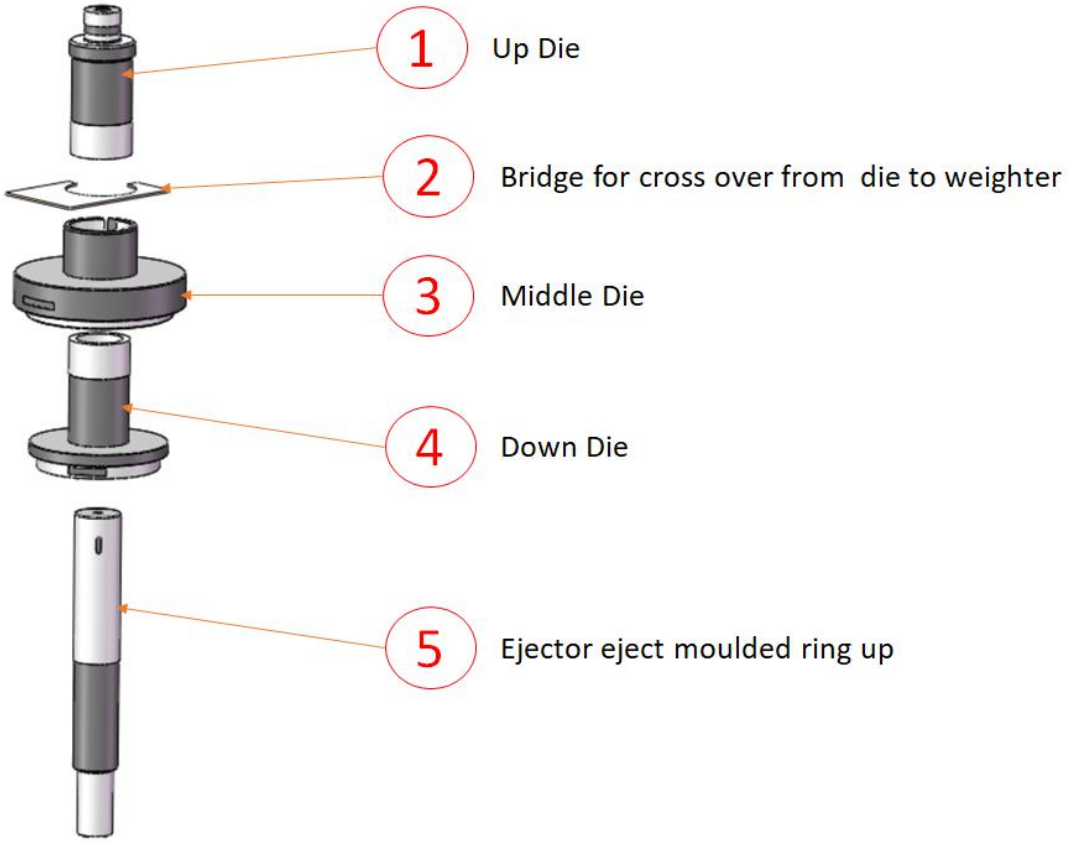
1. Power pack --- Hydraulic power pack provide high pressure for molding process under beneath；
2. Air vacuum-provide vacuum sock the graphite tape
3. Graphite plate --- load graphite tape, feed to the graphite feeding system ；
4. PLC and HIM --- fully automatic process controlling system；
5. Electronic cabinet
6. Mold set---- which is the core part make the product
7. Transfer Robot--- Transfer molded ring to collection
8. Cylinder ---- hydraulic cylinder；

Machine main structure

MGM-28 Graphite die molding machine consist of following main systems and parts,

---Graphite automatic feeding system, it can feeding set length of graphite tape and cut off automatically;

---Molding dies, it consists of up die, down die, spindle, ejector transfer bridge, details please see break down below,



---Transfer robot, transfer the molded ring to collection

---Sort robot, after weight move the good one to one side, while move NG to another side. (Optional system only as per customer's requirement)

---Hydraulic power pack, put under the base of the machine provide pressure for molding parts.

---Vacuum generator, provide vacuum to suck up the graphite tape, then twist inside of the down die.

Important tips

When you change molds, both up mold and down mold, do not assembly them to cylinder head and bottom base too tightly, leave some space for them, make sure they can line up properly.

Machine main features

1. **This machine is fully automatic process control;**
2. **Machine deployed a weight system, which measure the weight of the ring fully automatically and feed back to PLC , PLC then adjust the graphite tape length if graphite weight is not acceptable, therefore change the density of ring; PLC also automatically sort out the non-good part base on weight system feedback;**
3. **Graphite tape is fully corrugated except the first 30-50 mm flat in order to be caught by the spindle;**

4. **Quick change die design save time for change over;**
5. **Machine can store more than 500 sets of parameter setting, therefore, after first trial production, the user can save the setting into memory of the machine, each set of parameter setting refer to a code, next time the user need to change the code, then start production.**

Specification

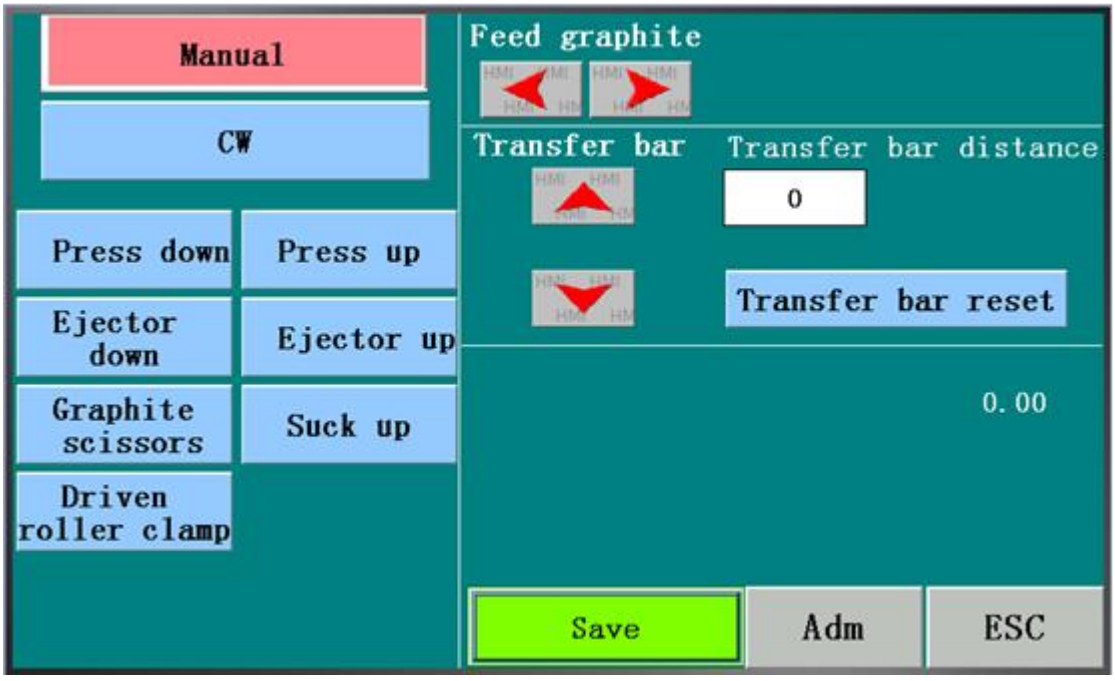
Type	MGM-28
Profile(L*W*H)	1200*850*1700mm
Net weight	820KG
Work mode	Fully automatic
Controlling	PLC Programmed process control
Max pressure	70 Ton
Power supply Max	5.5KW
Voltage	3 Phase 380V
Max OD	100 mm
Min ID	9mm
Max Graphite width	40mm
Weight accuracy	+/- 5%
Density adjustable	yes
Hydraulic oil	ISO VG32 or above

Machine controlling system

Machine controlling system consist of a programmed PLC and HMI, HMI display following pages

1. First page (See pic1)

You can choose manu mode or auto mode, press "MANU" it will show the second page as below, (pic2)



Under this page, you can manually control all actions of the machine,
CW---Control spindle twist counter wise.
Press down--- control press head or up die goes down
Press up--- control press head or up die goes up
Ejector down--- control ejector goes down
Ejector up--- control ejector goes up
Graphite Scissors--- Cut off graphite tape
Suck up--- suck up the graphite tape

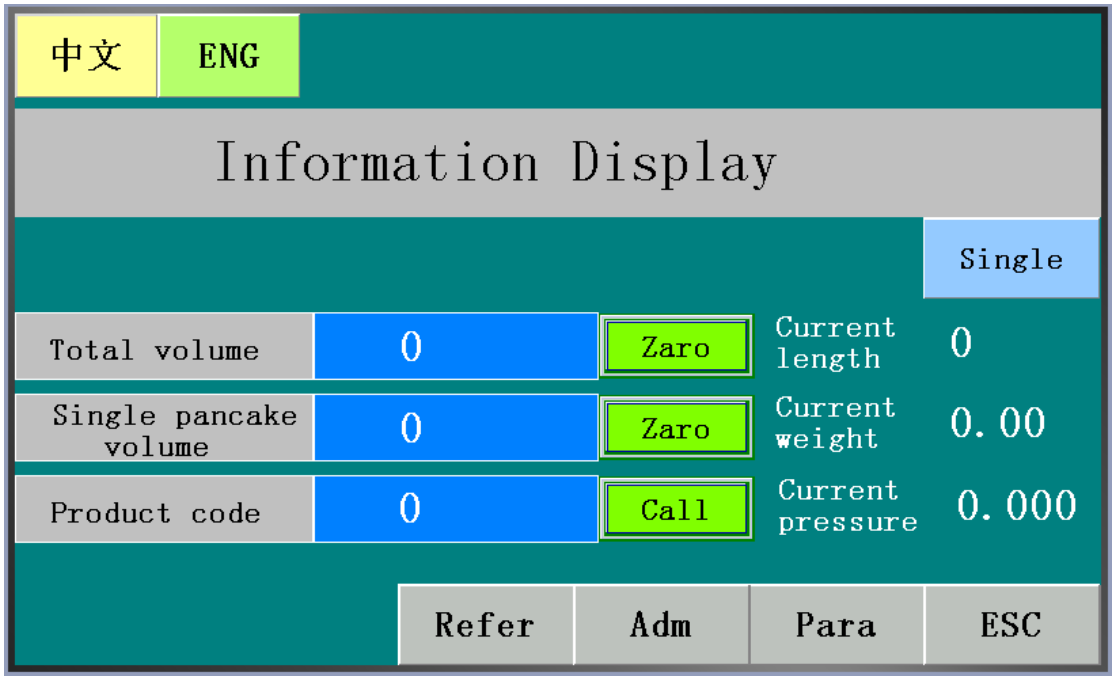
Driven roller clamp--- Control cylinder clamp or release tape.

Feed graphite  **control graphite tape go forward or withdraw;**

Transfer bar  **control molded ring move forward or back;**

Transfer bar reset---- Control transfer bar travel back to home position

If you press the "AUTO" It will show following page,



Under this page, it show all important information,

Total volume--- Tells you how many pieces of products been products.

Single pancake volume--- Means how many pieces of products can be produced by one pancake of graphite tape. This is very important information, will be explained in more detail in the chart of parameter setting.

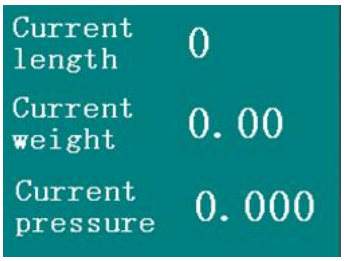
Product code--- This machine can save more than 500 sets of parameter settings, each product code represent one set of parameter setting, eg one specific product's parameter setting.

How to use a code to save a set of parameter setting?

Para ⇨ Define a code ⇨ Setup parameters ⇨ Press "Save" to save parameters

Once you saved the Para setting, next time when want to make the same type of gasket again, you can press " Refer", then the screen will show to the below chart, this Matrix show all each code represents one certain type of product. You can refer to it, find the right code, put it into the blue block right after "Code". It will pop out the below display, type in the code number, then press " Call" the parameter setting is done, you can start production, save lots of time from repetitive setting.

Single--- Under single mode, machine only produce one product, then stop, press it again, it will be changed to "Continuity", it will run production automatically.



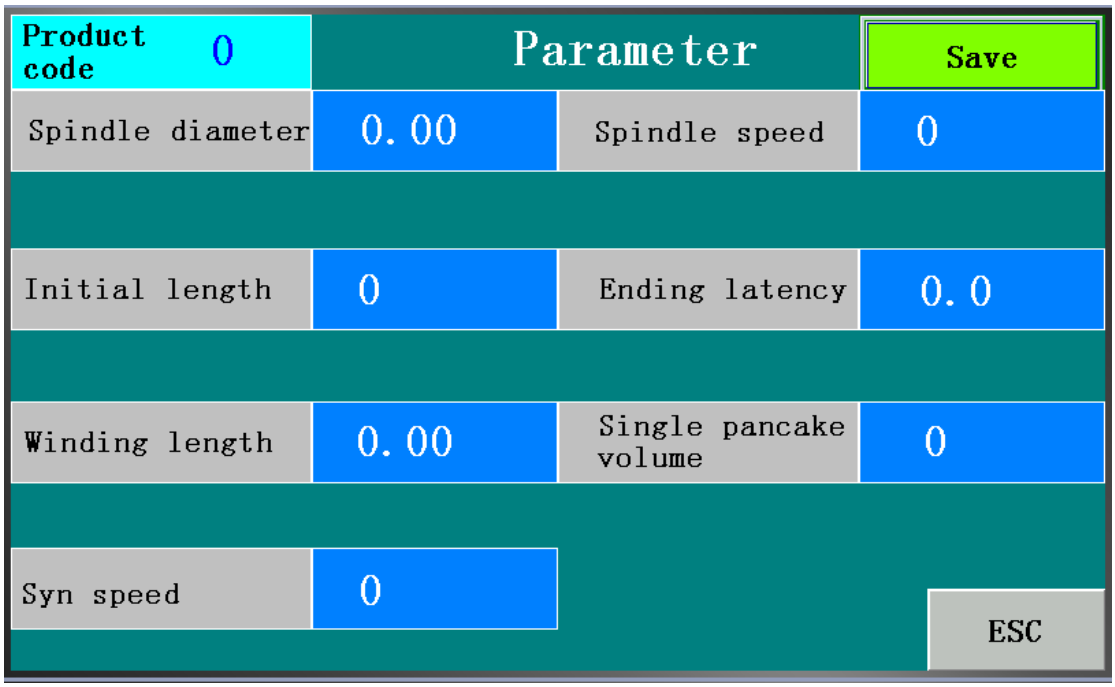
Those are just display information under automatic mode.

Machine set up

1. **Load the graphite tape.**
2. **Turn on power.**
3. **Connect air pipe to compressed air source.**
4. **Go to Manual mode, feed the graphite tape into channel, manually control cutter cut off the tape, and remove the tail, now machine is fully ready for make product.**

Parameter Setup

Press “Para” it will show the below page for parameter setting,



Winding length---Control total length of graphite tape;
Ending latency--- control the tail length, it change up to the product size;
Spindle diameter---Spindle which sock the tape up and twist, this is important input parameter, it determine few other parameter by PLC calculation.
Single pancake volume---This is also important input, it means one pancake of tape can produce how many pieces of one specific products. One set volume reached, you must change another pancake of graphite tape, this machine can not connect the graphite tape if it run out during middle process of one product.

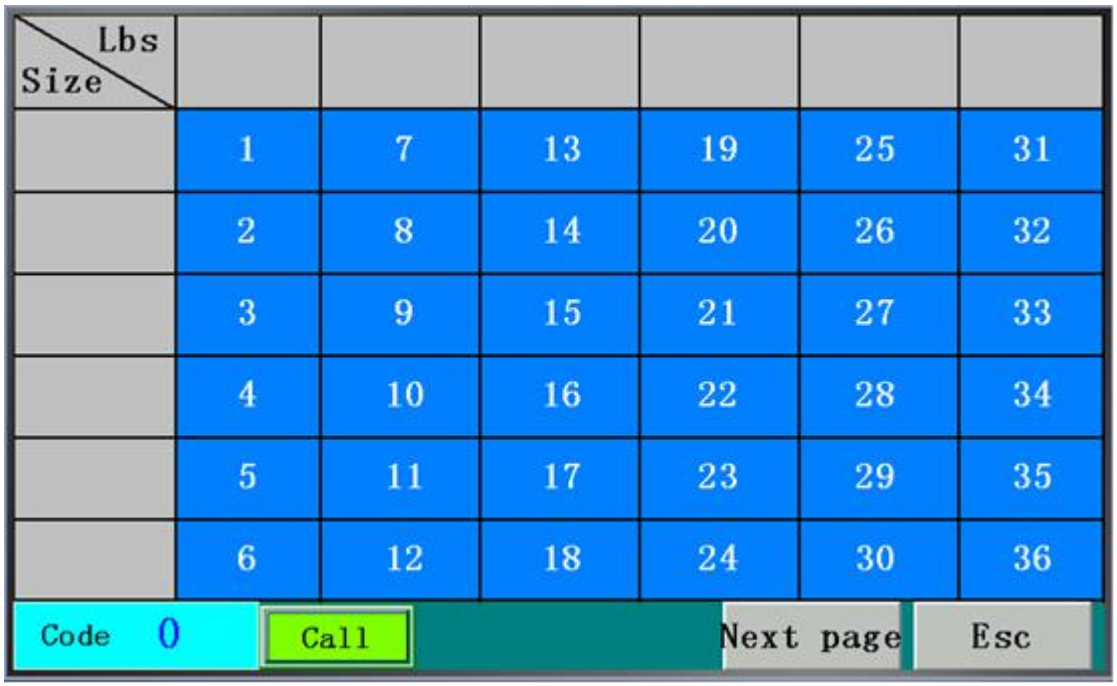
Pressure--- Pressure setting depends on each product, once reach the pressure level, and keep for dwell time, press will go up automatically.

Dwell time--- Keep pressure for certain long time ensure good molding quality.

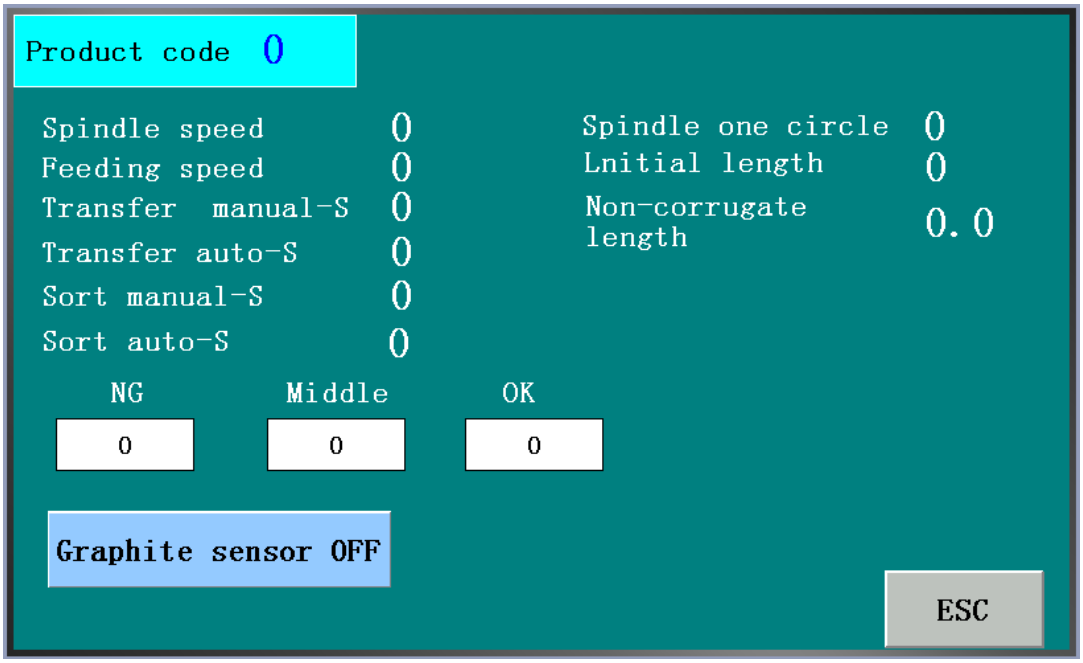
Product weight--- This machine deployed a weight system, with weight deviation setting. machine can quickly weight molded ring, and judge its GOOD or NG.

Weight deviation--- Give a tolerance for certain products, it is also the base to judge product GOOD or NG; machine will automatically adjust the length of tape if machine constantly produced 5 pieces of over-weight or less-weight products

Press " Refer" you will see below page, where you are record your product code of each specific product in the matrix, so when you want to make same size of product next time you can refer to the matrix and recall that product code, therefore save time for set up parameters again.



If you press "Adm" it will show following page administrator's parameter.



This page is only for administrator's purpose, don't change anything unless agreed by administrator.

Process Map

Step 1 Set up parameters, or call a product code;
Step 2 Load graphite pancake, go to Manual mode, feed the graphite tape into channel, manually control cutter cut off the tape, and remove the tail, feeding system will automatically feed out initial length of tape, ready for automatic process;
Step 3 Switch back to AUTO mode then press green "Start" button, machine will run production automatically.

Safe Instruction

1. Never open the any doors of the machine during process;
2. When feed tape, make sure keep finger safe distance away before press "Scissors" from the press roller.
3. Don't open electronic box when electrician is absence.

END